

the adventures of a sportsman in Norway, supplies us in the present sketch with a comprehensive *résumé* of the flora of the Fjelds. The spot he has chosen for his point of observation is the double-topped hill Knudshö, near Kongsvold, well known to the botanists of other countries, as well as to those of Norway, for its exceptionally rich and varied Alpine flora. Here may be gathered the rare *Artemisia norvegica*; the gentians, *nivalis* and *glacialis*; some of the less common saxifrages, numerous species of *Carex* and *Salix*; and some Alpine forms, as *Kobresia caricina*, *Chamaerops alpina*, which are not found elsewhere so low down; while here, too, the collector will find close at hand a number of sub-Alpine and south-Norwegian plants of rare occurrence in other parts of the country. Herr Barth, himself an enthusiastic botanist and a practised collector, never fails to give the local and ordinary Norwegian name of the plant he describes, in addition to its scientific designation; and thus supplies foreigners with very valuable and much-needed information, the want of which often proves to be a matter of great inconvenience in studying the flora of a foreign country.

*Om Grantörken og Barkbiller.* J. B. Barth.—In this little pamphlet the author, who is one of the first authorities in Norway on questions of forestry and arboriculture generally, explains his reasons for differing from the opinion commonly received, that the desiccation and ultimate death of the Norwegian spruce (*Abies excelsa*) are due to the attacks of *Tomicus typographus* (*Bostrychus typographus*), which is usually regarded as the most pernicious of all the insect-enemies of the Coniferae. Herr Barth does not dispute the fact that this beetle is to be found often in large numbers on trees affected by abnormal drying up, whether still standing or cut down; but, in his opinion, although disease in the tree may be the cause, it is not the result of the presence of the *Tomicus*, which he believes to have absolutely no effect on the condition of the bark. According to this view the numerous agents employed in Germany and elsewhere to eradicate this beetle have no result but waste of labour and money; the only remedy against the drying up of the bark being a more scientific mode of clearing forests, in which the trees often perish either through overcrowding, or more frequently through reckless felling, by which cold blasts are allowed to fall directly on the interior. Herr Barth's views are in opposition to those of the majority of the working foresters of Germany and Scandinavia, but his extensive acquaintance with home and foreign forests, his great practical experience, and his reputation as a naturalist, entitle them to all possible respect, although it is not to be supposed that his plea for the innocuousness of the *Bostrychus typographus* will be admitted without much sifting of the evidence, seeing that this insect is generally believed by German foresters to have been the cause of the destruction of the forests of the Harz Mountains, when between 1780 and 1790 two million trees died of desiccation.

### SPECTROSCOPIC INVESTIGATIONS<sup>1</sup>

AS I have stated in my former communication,<sup>2</sup> all chemically related elements exhibit a homology of spectra, the various spectra of the elements of a group differing solely in the manner in which their groups of lines are shifted towards one end or other of the spectrum.

In a comparative investigation on the alkaline earths, I have arrived at conclusions which may explain these remarkable analogies in chemically-related elements.

I have now the honour of laying before the Academy a brief account of my investigations; on another occasion I shall report on this subject more fully.

If the spectra of the alkaline earths are produced by a jar-spark in a hydrogen-atmosphere,<sup>3</sup> spectra are obtained which show the homology of the spectral lines very beautifully. The spectrum of magnesium cannot be compared with the spectra obtained in this manner, because it does not contain the less refrangible lines. However, without the jar, or employing a smaller battery and a smaller induction-coil, it appears that in the spectra of calcium and strontium all lines in the red and yellow disappear, and the spectra which become visible are remarkably similar to those of magnesium.

<sup>1</sup> By G. Ciamician, in *Sitz. Ber. der k. Akad. der Wiss.*, Vienna, Vol. Lxxiv. Heft i.

<sup>2</sup> "Ueber die Spectren der chemischen Elemente und ihrer Verbindungen" (vol. Lxxvi. chapter ii., October, 1877). "Ueber den Einfluss der Dichte und der Temperatur auf die Spectren von Dämpfen und Gasen." (vol. Lxxviii. chapter ii., October, 1878.)

<sup>3</sup> With four of six medium Bunsen's elements and a great Gaiffe's induction coil giving a spark of 10 centimetres.

Comparing the less refrangible part of the spectrum of the alkaline earths, which are only rendered visible by increased temperature with the less refrangible half of the entire oxygen spectrum, we find the remarkable fact that these two halves of the spectra show a decided resemblance or homology. From this we may conclude that *the spectrum of the groups of the earth-alkali metals is composed of the spectrum of magnesium and of that of the less refrangible parts of oxygen.*

In order to determine the real importance of these remarkable analogies—it being known that the atomic weights of baryum, strontium, and calcium are capable of being composed of the atomic weights of magnesium and oxygen<sup>1</sup>—I found it necessary to analyse the spectra of combinations, which are not saturated, but behave as compound radicals, and thus most resemble in chemical behaviour the simple radicals or elements.

Hitherto I have analysed cyanogen and carbonic oxide. The cyanogen spectrum comprises two portions, one of which is the homologue of the nitrogen spectrum, the other the homologue of the less refrangible part of the carbon spectrum.

Also in the carbonic oxide spectrum there are present the well-known groups of carbon appearing as bands, and displaced in the red field there are several lines homologous to those of oxygen. Therefore the same relation exists between the spectra of nitrogen and carbon, and between the spectra of cyanogen, carbon, and oxygen, and carbon oxide spectrum, which prevails between the spectra of magnesium and oxygen and the spectra of the earth-alkali metals.

One can go further and say that in general the homology of the spectral lines of chemically-related elements is in all probability based upon the circumstance that the elements of such natural groups conform to the laws of Mendelejeff on atomic weights, and consist of identical components.

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The Science Lectures at Cambridge this term include Prof. Liveing on the General Principles of Chemistry, and on Spectroscopic Analysis; and Prof. Dewar on Physical Chemistry. One of the demonstrators will give demonstrations in Volumetric Analysis; and Mr. Scott, assistant to Prof. Dewar, will give a course of demonstrations in Elementary Organic Chemistry. For permission to carry out special investigations in the University laboratories application should be made to one of the Professors.

Lord Rayleigh will lecture on Galvanic Electricity and Electro-Magnetism in the Cavendish Laboratory; Dr. Schuster will lecture weekly on Radiation; Mr. Glazebrook will give an elementary course of demonstrations in Electricity and Magnetism; and Mr. Shaw will give demonstrations on the Principles of Measurement and the Physical Properties of Bodies. Courses of demonstrations are announced for the Lent Term on Heat and Advanced Electricity and Magnetism; and for the Easter Term on Light, Elasticity, and Sound.

Mr. W. J. Lewis will lecture on the Silicates, in the [Mineralogical Lecture-room.

Mr. F. M. Balfour will give elementary and advanced courses on the Morphology of Invertebrata, with practical work. Prof. Humphry will lecture on the Osseous System; Prof. Hughes on the Principles of Geology, with Field Lectures; Prof. Latham on Therapeutics; Prof. Newton on Invertebrata; Prof. Stuart on Mechanism.

It is to be hoped that something may be done this term to relieve science students in the matter of Greek, and to encourage French and German studies, for want of which there is so much hindrance to science, as well as literature. The Sedgwick Geological Museum, with money accumulating, must still wait, we suppose. Will the Museum be ready for 1900?

Mr. Sedley Taylor will lecture on the Acoustics of Music in the Cavendish Laboratory.

### SCIENTIFIC SERIALS

*Bulletins de la Société d'Anthropologie de Paris*, tome iii. fasc. 2 (1880).—M. Robin, Inspecteur primaire du Département de Loiret-Cher, has laid before the Society his scheme for obtaining important anthropological measurements by the help of teachers of schools. The proposed questions, with a full description of the various appliances by which such measurements could be

<sup>1</sup> It is, namely,  $24 + 16 = 40$  (calcium),  $24 + 4 \times 16 = 88$  (strontium), and  $24 + 17 \times 16 = 136$  (barium).

taken, have been submitted to the consideration of a special commission.—M. J. Parrot's paper on the development of the brain in infants, considers the subject chiefly in reference to the modifications of colour which the medullary substance undergoes.—The present number of these *Bulletins* gives M. P. Broca's remarks on his "goniomètre flexible," of the various parts of which drawings are appended.—M. Harmand makes the interesting communication that some Cambodian inscriptions, hitherto undeciphered, have been found by Prof. Kern, of Leyden, to be Sanskrit, written in Kawi and Kalinga characters.—M. Vinson suggested that fixed rules should be drawn up for the transcription of foreign words, and should form part of the official anthropological instructions provided for travellers and explorers in savage countries. His suggestion has been accepted.—In addition to the article already referred to on the flexible goniometer, these *Bulletins* contain several papers from the pen of the late M. Paul Broca, which will be read with the more interest as being among the last of his communications to the Society; these are his post-mortem reports of the appearances presented in the thorax of a young Zulu girl, with his remarks on a retrogressive anomaly in the aorta of this girl; a description of the appearances of the cranium of the assassin Prévoist, more especially with reference to the assumed importance of the protuberance between the occipital and parietal, to which Gratiolet applies the term *calotte*, and which he regards as a simian character. M. Broca considered that in the interests of physical science it would be desirable that greater facilities should be afforded to scientific men for obtaining the heads of those who die in public prisons, asylums, &c. Finally we have the report of M. Broca's remarks on the case of an illiterate boy of eleven, possessed of extraordinary powers of calculation, and evincing surprising facility in extracting cube-roots. The consideration of this case gave additional interest to the discussion that had been raised at an earlier meeting, in regard to Galton's observations on the vision of serial numbers.—M. Moudière has drawn up a monograph on the women of Cochinchina, in which he has embodied the results of six years' laborious anthropological researches. The three races of Annamites, Cambodians, and Chinese, of which the Cochinchina population is composed, were severally studied.—M. Bertillon gives the results of his comparative analysis of the statistical tables of suicides for France and Sweden. The results show singular accord between the two countries, and the author considers himself justified in maintaining that they establish the two following laws:—1. That widowers commit suicide more frequently than married men. 2. That the existence and presence in the house of children diminishes the inclination to suicide both in men and women.—M. Rene de Semallé gives a comparative table of the mean length of the generations of mankind, based on the genealogy of the reigning and other princely families in Europe. From these it would seem that the period of thirty years, which in common parlance is accepted as that of a generation, very closely corresponds with the means obtained from these genealogical data.—M. Fourdrignier gives the result of his exploration of the double tumuli found at Thuizy, near Rheims, among a large number of other graves in which only one individual had been interred. Where these graves have escaped earlier spoliation, the human remains and the broken fragments of ornaments found in them would appear to show that the individuals buried together were of different sex. M. Fourdrignier has made an interesting discovery of the several parts of two conical casques. The fragments of these singular head-coverings were extracted from two of the double graves, and, according to their discoverer, they belong to a Gallic race of the pre-Roman period, and must in form have closely resembled the modern German "Pickelhaube."

## SOCIETIES AND ACADEMIES

### PARIS

Academy of Sciences, October 4.—M. Wurtz in the chair. M. Perrier presented a *Compte rendu* of the determinations of longitudes, latitudes, and azimuths in Africa under his direction, at Geryville, Laghouat, Biskra, and Carthage in 1877 and 1878, with a description of instruments and methods. In the exchange of signals it was possible to calculate the mean retardation of transmission of a signal along an aerial conductor, from chronograph to chronograph, for distances comprised between 414 km. and 1,236 km. The mean velocity of propagation was found about 40,000 km. At this rate an electric signal would go round the earth in a second.—Military and geographical explo-

ration of the region comprised between the Upper Senegal and the Niger, by M. Perrier. A Government expedition under Commandant Desbordes was to start on the 5th, Commandant Derrien having charge of the topographical department. They go to St. Louis, and make their way to Bafoulabé, at the confluence of the Bafing and the Bakhoy. Here they construct their first fort, and organise escorts and convoy, with a view to a general triangulation of the region between Bafoulabé on the Senegal, and Dina and Bamakou on the Niger. The railway contemplated would run from Medina, by Bafoulabé and Fangalla, to the Niger.—Order of appearance of the first vessels in the spike of *Lepturus subulatus*, by M. Trécul.—M. de Lesseps presented the "Bimensual bulletin of the Inter-oceanic Canal" for September.—On utilisation of the crystals of lead-chambers, by MM. Girard and Pabst. The crystals offer an abundant and economical source of nitrous acid, and the authors have been able to prepare on a large scale, the dinitric bodies, amidoazobenzol and nitroalizerine, by making the nitroso-sulphuric acid act on the corresponding amidised derivatives, or aniline and alizerine. But the crystals can only be employed in presence of a quantity of sulphuric or nitric acid (preferably the former) sufficient to prevent their decomposition by water.—Observations of Faye's comet made at the Observatory of Florence-Arcetri, by M. Tempel.—On some thermometric questions, by M. Crafts. It is very probable that the least change of volume of a thermometer is accompanied by a change of the coefficient of dilatation.—On the decomposition of salts by liquids, by M. Ditte. The laws of dissociation by heat which apply to decomposition of salts by pure water and by saline or acid solutions, apply also to decomposition by alcohols, and probably in general to decompositions of salts by the wet way, whatever the solvent.—On the physiological action of *Contum maculatum*, by M. Bochefontaine. Conine diminishes or abolishes the physiological properties of the nervous centres before acting like curare on the "nervo-muscular junctive substance" (Vulpian). In the dog and frog it at length abolishes the nervous excitomotricity if given in sufficient quantity, and it is fatal for batrachians as well as for mammalia. Hemlock then may act like curare, but it has additional physiological effects.—Floral dimorphism and staminal petalody observed in *Convolvulus arvensis*, L.; artificial production of this latter monstrosity, by M. Heckel. Petalody is the effect of direct fertilisation long continued. The autogamic process in plants as in animals (but in a longer period with the former) has the result of altering the organs of reproduction and leading to absolute infertility.

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